

SUNLABOB SOLAR LANTERN RENTAL SYSTEM

VILLAGE ENERGY COMMITTEE MANUAL



Version 4.1 – August, 2011

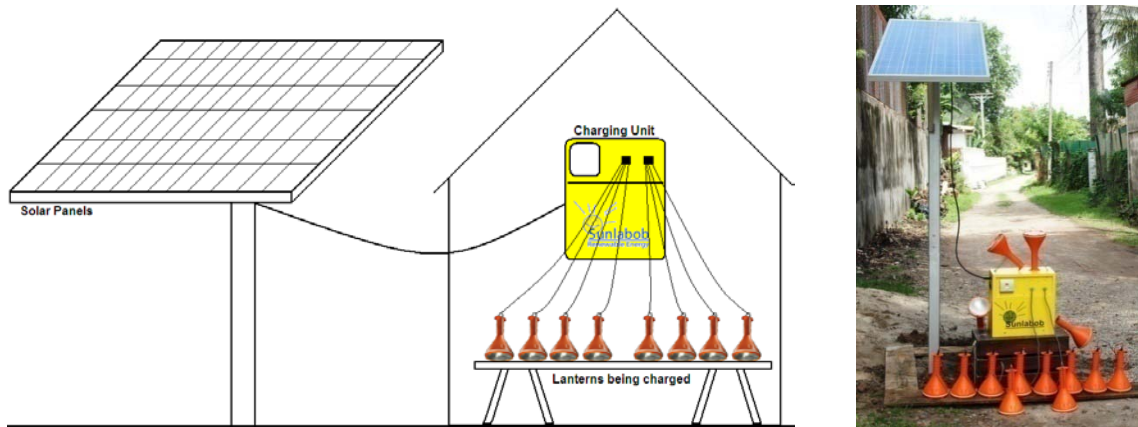
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INTRODUCTION

A diagram of the lantern system is shown below. It shows the solar panel, connecting cables, the charging unit and the lanterns.

System Operation



The system provides the user with variable hours of lantern operation (dependent on brightness level) with every rental cycle, or equivalent use of a mobile phone charger, radio, or any other device that can be charged from the USB charging socket on the lantern. After this time the lantern's internal microcontroller shuts off the power and the lantern cannot be turned on again.

Once the lantern has been used for the operable hours the user must then take the lantern to **the Village Technician (VT) who operates the charging station**. Each time they will give a small fee to the village technician. One part of this money will be used by the VT to run his micro enterprise and another will go to a maintenance fund for the future replacement of components. The VT then connects the lantern to the Sunlabob Charge Controller and can begin charging procedure.

The VT connects the lantern to the charge controller until it is fully charged. The VT at each charging station will do most of the scheduled maintenance.

Occasionally, the Head Office will need to send a technician to a charging station to solve any technical issues or to install new components.

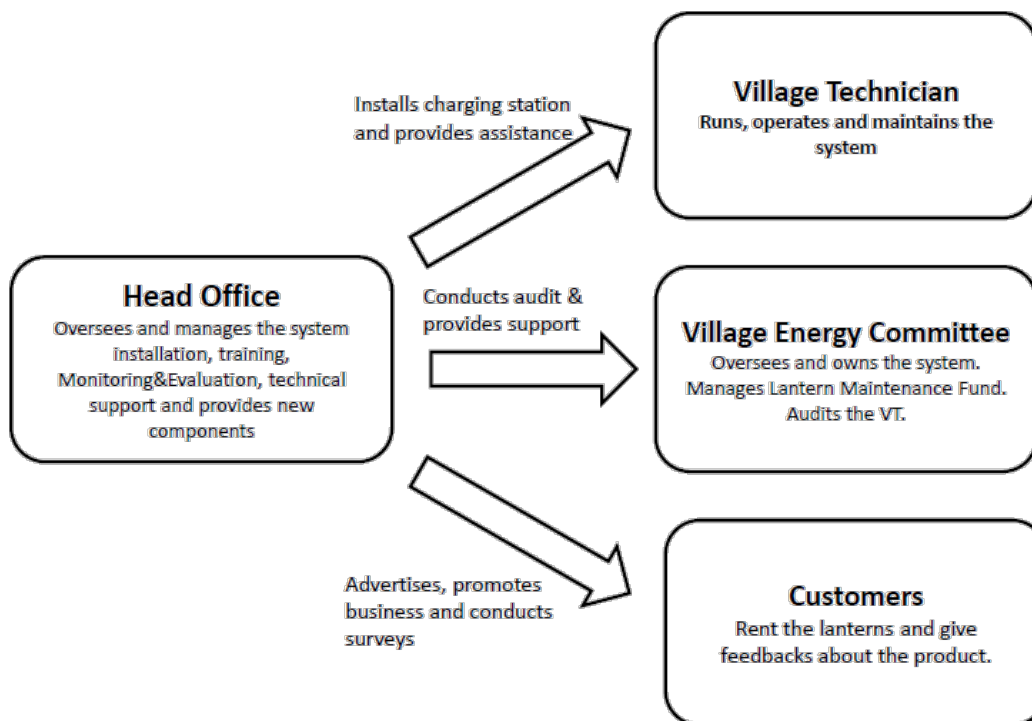
1. ROLES AND RESPONSIBILITIES

Head Office

The Head Office is responsible for the overall operation of the system. The Head Office reserves the right to remove the SLRS equipment if it is found that the village is using the system improperly or damaging the equipment.

Responsibilities:

- Install charging stations and repair or replace any faulty components when required as long as the equipment has been used according to the recommendations in the user manual;
- Keep all spare parts in stock to replace as notified by the VT;
- Select suitable candidates for VT and Village Energy Committee (VEC) roles;
- Provide training for the VT, VEC and customers;
- Make sure that all the stakeholders (head of the village, VEC and VT) sign the SLRS agreement;
- Periodically audit the VT and VEC;
- Set rates and fees for lantern charging after discussion with VEC and determine what percentage goes to VT, VEC and Lantern Maintenance Fund (LMF);
- Ensure operational model is followed and take action to correct problems;
- Update the operational model if required;
- Use various marketing methods to raise awareness of system and its benefits;
- Identify potential sites for systems.



Village Energy Committee (VEC)

The VEC assumes ownership of the lanterns on behalf of the village. The VEC collects money every month from the VT and divides this money in 2 parts: one for the Lantern Maintenance Fund (LMF) and the other for their salary. LMF money is used only for repair, replacement and maintenance of the lanterns. The VEC shall not have more than four members. Each member shall receive a monthly salary.

Responsibilities

- Perform monthly audits of VT logbooks and make sure all documents are available and up-to-date;
- Keep the money collected for the Lantern Maintenance Fund safe and only spend on lantern maintenance;
- Keep accurate records of Lantern Maintenance Fund expenses and income in the Maintenance Fund Log;
- Keep a small stock of spare lantern parts and make them available to the VT as needed;
- Keep accurate records of the stock of spare parts in the Inventory;
- Order extra parts as required;
- Settle disputes between VT and customers;
- Present the systems to new customers and make them sign the customers' agreement;
- Take appropriate action against those who damage lanterns or system components.

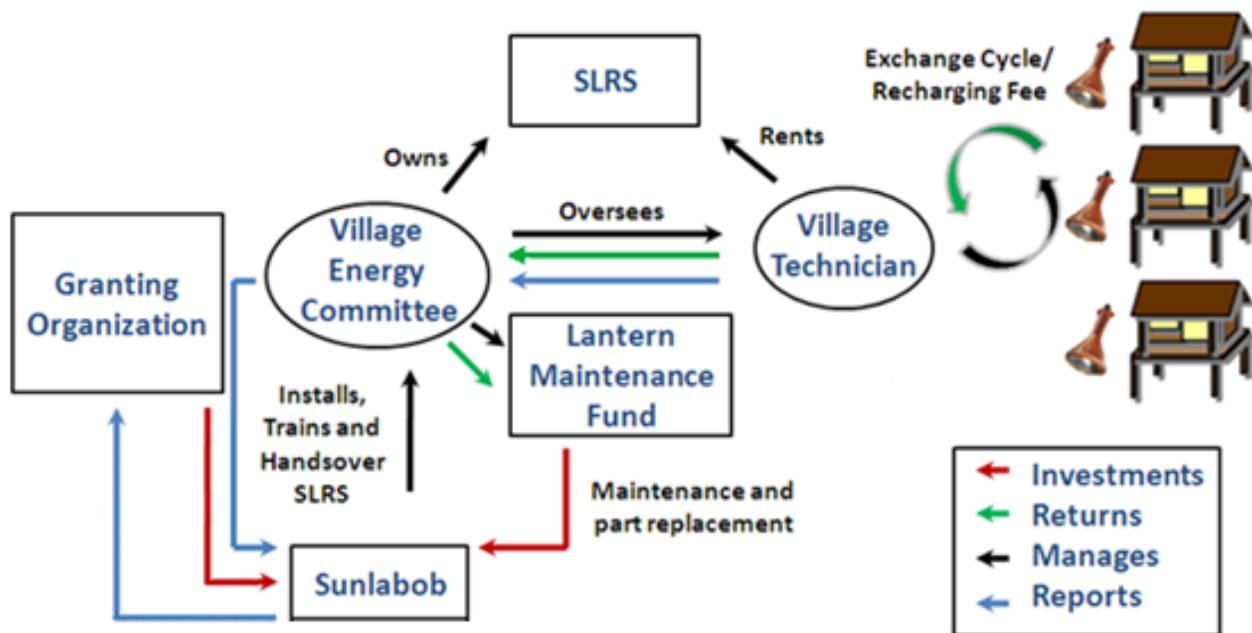
Village Technician (VT)

The VT rents the charging station from the village. The VT will then use the charging station to supply charged lanterns to his customers. The VT collects the fees from the users and divides this money in two parts: one for his salary (a percentage on each fee) and the other is given to the VEC (for the maintenance fund and the VEC members' salary).

Responsibilities:

- Keep the charging station and lanterns in working order and report any problems to the Head Office;
- Charge the lanterns during day time and turn off the system during night time;
- Collect money from the customers for renting charged lanterns;
- Collect penalties from the customers if the lanterns are brought back after 5 days (optional);
- Divide the money collected between the VEC, salary for the VT and the money for the maintenance fund;
- Make timely payments (VEC salary and maintenance fund) to VEC;
- Make entries of lantern rentals and returns in the Accounting Log with their IDs;
- Check the lanterns' conditions and resolve issues with customers;
- Keep a log of all maintenance activities in the Maintenance Log.

An overall diagram showing the stakeholders and their responsibilities is shown below:



2. MAINTENANCE FUND LOG

This log keeps track of how much money is collected from the VT each month and how much is spent on replacement items. A checklist for the audit of the VT is also given.

Completing the Log

Write the location, month, and year at the top of every page used.

When the VEC notices items are needed, order more parts from the Head Office.

1. Put the needed part in the 'Item' column
2. Put the number of parts needed in the 'Quantity' column
3. Put the price of the part in the 'Cost per Item' column. Prices can be obtained from the Head Office.
4. Multiply the Quantity by the Cost per Item and put the result in the 'Total' Column
5. Add up the totals and put the sum next to the 'Total Spent this Month' box

Maintenance Fund Log

Village / Location: *Thongbay Village*

Month: *March* Year: *2010*

Expenses			
Item	Quantity	Cost per Item	Total
Charge Controller	<i>20</i>	<i>50</i>	<i>1000</i>
Lanterns	<i>40</i>	<i>40</i>	<i>1600</i>
Batteries	<i>2</i>	<i>200</i>	<i>400</i>
Total Spent this Month			<i>3000</i>

Income Part of the Log

1. Rented Fill in the 'Total Number of Lanterns this Month' by asking the VT.
2. Enter the money received from the VT for the month in the 'Money Collected from VT's box. The money collected equals the number of lanterns rented multiplied by the cost per lantern (in this example it is 5000), then multiplied by the Maintenance Fund percentage (in this example it is 40%).

When collecting the Maintenance Fund money from the VT the VEC can also collect the money for their salaries. The amount of money for VEC salaries is calculated on the VT accounting log.

The money should be stored in a separate cashbox containing only the money in the Lantern Maintenance Fund. This money is only to be used for maintaining lanterns.

Income

Total Number of Lanterns Rented this Month	250	$(250 \times 5000 = 1,250,000)$
Money to Maintenance Fund	500,000	$(1,250,000 \times 0.4 = 500,000)$

Money Collected from VT= (Number of Lanterns x Cost per Lantern x VEC percentage)

Balance Part of the Log

1. Fill in the 'Previous Month's Total in Lantern Maintenance Fund' using the number from the previous page of the log.
2. Fill in the 'Total Spent this Month' using the number from the Expenses section.
3. Fill in the 'Money Collected from VT' using the number from the Income section.
4. Subtract the Total Spent from the Previous Monthly Balance and add the Money Collected to get this month's balance, write the total next to the 'Total in Lantern Maintenance Fund' box

Balance

Previous Month's Total in Lantern Maintenance Fund		1,240,000
Total Spent this Month	-	220,000
Money Collected from VT	+	500,000
Total in Lantern Maintenance Fund		1,520,000

Monthly Fund = (Previous Total Fund - Total Spent This Month + Money Collected from VT)

A blank Maintenance Fund Log is contained in Appendix A.

3. INVENTORY LOG

Use this log to keep track of how many replacement parts are available and to know when to order more. For each item in the list, record the date that some of the items are given to the VT for lantern maintenance and the number of items left. When the supply becomes low, purchase from the Head Office. Try to order many items at one time to reduce the delivery costs.

1. Tags may get used often, so try to keep at least 20 in the inventory. The number of broken ones does not need to be recorded.
2. The VEC should try to keep at least 1 extra charge controller available. The charge controllers will need to be returned to the Head Office for disposal.
3. Three complete lanterns will be supplied to replace any lanterns that stop working. Broken lanterns should never be opened and must be returned to the Head Office when receiving replacements.
4. Check with the VT how many spare fuses 2A left (for the lanterns' wires). New fuses need to be ordered if less than 2 left.
5. No extra batteries will be provided.

VEC Inventory Log

Village / Location: *Thongbay Village*

Month: *August*

Year: *2010*

Fuses	Date	<i>1/3/10</i>	<i>5/4/10</i>	<i>30/8/10</i>	
	In Stock	<i>10</i>	<i>2</i>	<i>12</i>	
Tags	Date	<i>1/3/10</i>	<i>5/4/10</i>	<i>30/8/10</i>	
	In Stock	<i>30</i>	<i>10</i>	<i>60</i>	
Charge Controllers	Date	<i>1/3/10</i>	<i>20/4/10</i>	<i>30/8/10</i>	
	In Stock	<i>3</i>	<i>2</i>	<i>3</i>	
	Broken	<i>0</i>	<i>1</i>	<i>0</i>	
Lanterns	Date	<i>1/3/10</i>	<i>13/5/10</i>	<i>20/6/10</i>	<i>30/8/10</i>
	In Stock	<i>3</i>	<i>2</i>	<i>1</i>	<i>3</i>
	Broken	<i>0</i>	<i>1</i>	<i>2</i>	<i>0</i>
Batteries	Date	<i>1/3/10</i>	<i>8/4/10</i>	<i>17/7/10</i>	<i>30/8/10</i>
	In Stock	<i>0</i>	<i>0</i>	<i>0</i>	<i>2</i>
	Broken	<i>1</i>	<i>2</i>	<i>0</i>	<i>0</i>

A blank Inventory Log is contained in Appendix B.

4. AUDIT INSTRUCTIONS

In addition to auditing the VT, the VEC can be audited by the Head Office at any time. All logs must be up-to-date and there must be the correct amount of money in the Lantern Maintenance Fund cashbox.

Audit of VT

Every month when collecting money from the VT the VEC shall audit the VT. This audit shall include checking the VT's logs and checking that all maintenance is being done. At the bottom of every month of the Maintenance Fund Log there is a small checklist to complete during the audit.

If the numbers do not match, put an 'X' in the box, write a comment, and try to determine why they do not agree. If the VEC and VT cannot agree on which numbers are correct, contact the Head Office and report the problem.

1. Ask to see the VT's Accounting Log.
2. At the bottom of each page, the Total Lanterns Rented is recorded. Check that this number is correct and that it matches the 'Total Number of Lanterns Rented this Month' in the Income section of the VEC log. If the numbers match, put a tick in the 'Check Total Lanterns Rented' box.
3. At the bottom of each page, the 'Money to Lantern Maintenance Fund' is recorded. Check that this number is the same as the number in the 'Money Collected for Maintenance Fund' in the Income section of the VEC log. If the numbers match, put a check in the 'Check Money to Maintenance Fund' box.
4. Check the VT's Maintenance Log. If the VT has been doing all of the maintenance work, put a check in the 'Check Maintenance' box.
5. The VT should record when a lantern is damaged and if a customer did the damage. The VEC can take appropriate action against customers who damage the lanterns.
6. After the end of the audit, the member of the VEC who performed the audit should sign at the bottom of the audit checklist.

Audit Checklist	Comments	
Check Total Lanterns Rented	✓	
Check Money to Maintenance Fund	✓	
Check Maintenance	X	<i>Panels were dirty but Maintenance Log showed they were cleaned yesterday</i>
Audit Performed By	<i>Mr. Khamphone</i>	

5. NEW CUSTOMERS

The VEC should supervise the training provided by the VT to the new customers. They need to understand how the lanterns and SLRS work and who the different stakeholders are and their roles. After signing the customers' agreement with the VEC, each new user should receive one "customer's manual" (a stock of manuals will be provided by the head office to the VEC at the beginning of the project).

Appendix A – Maintenance Fund Log

Village / Location: _____

Month: _____

Year: _____



Expenses

Item	Quantity	Cost per Item	Total
Tags			
Charge Controller			
Lantern			
Battery			
Fuses			
VEC Salary			
Total Spent this Month			

Income

Total Number of Lanterns Rented this Month	
Money Collected from VT	

Money Collected = (Number of Lanterns x Cost per Lantern x VEC percentage)

Balance

Previous Month's Total in Lantern Maintenance Fund	
Total Spent this Month	-
Money Collected from VT	+
Total in Lantern Maintenance Fund	

Monthly Fund = (Previous Total Fund - Total Spent This Month + Money Collected from VT)

Audit Checklist		Comments
Check Total Lanterns Rented		
Check Money to VEC Totals		
Check Maintenance		
Check Problem Log		
Audit Performed By:		

Appendix B – Accounting and Audit Log

Village /
Location:

Item							
Fuses	Date						
	New						
Tags	Date						
	New						
Charge Controller	Date						
	New						
	Broken						
Lanterns	Date						
	New						
	Broken						
Other	Date						
	New						
	Broken						